

We claim:

1. ~~A composite roof structure, comprising:~~

- A. a roof deck,
- B. at least one layer of roofing material, and
- C. an adhesive reaction product of a one-part, moisture curable, foaming, polyurethane adhesive composition, consisting essentially of;
  - i. an isocyanate terminated prepolymer prepared from at least one organic polyisocyanate and at least one composition containing at least two isocyanate reactive moieties, and
  - ii. a reversibly blocked catalyst consisting essentially of the addition product of a sulfonyl isocyanate, a tertiary amine, and/or a tin(II) or tin(IV) carboxylate composition;

wherein the reversibly blocked catalyst is dissolve or dispersed in the isocyanate terminated prepolymer and the one-part, moisture curable, foaming, polyurethane adhesive composition is free of foam stabilizers and low boiling diluents having boiling points from about 20°C to about 80°C.

- 2. The composite roof structure as claimed in claim 1, where the roof deck is plywood, chipboard, concrete, ferrous or non-ferrous metal or an existing composite roof structure.
- 3. The composite roof structure as claimed in claim 1, where the roofing material is a thermoplastic membrane, a rigid foam panel, a polyvinylchloride membrane, or a chlorosulfonated polyethylene membrane.
- 4. The composite roof structure as claimed in claim 1, where the organic polyisocyanate is a diphenylmethane diisocyanate.
- 5. The composite roof structure as claimed in claim 1, where the composition containing at least two isocyanate reactive moieties is a polyether polyol free of nitrogen.
- 6. The composite roof structure as claimed in claim 1, comprising; more than one layer of roofing material.

7. ~~The composite roof structure as claimed in claim 1, where the reversibly blocked catalyst is the addition product of a sulfonylisocyanate, a tertiary amine, and a tin(II) or tin(IV) carboxylate composition.~~

8. A method of adhering roofing material to a roof deck, comprising;

A. applying a one-part, moisture curable, foaming, polyurethane adhesive composition, consisting essentially of ;

- i. an isocyanate terminated prepolymer prepared from at least one organic polyisocyanate and at least one composition containing at least two isocyanate reactive moieties, and
- ii. a reversibly blocked catalyst, consisting essentially of; the addition product of a sulfonyl isocyanate and a tertiary and /or a tin(II) or tin(IV) carboxylate composition;

to a roof deck;

B. positioning the roofing material on the deck with sufficient pressure to seat the roofing material in the polyurethane adhesive composition; and

C. allowing the polyurethane composition to foam, fill and cure.

9. The method of adhering roofing material as claimed in claim 8, where prior to applying the polyurethane adhesive composition to the roof deck, the roof deck is misted with water.

10. The method of adhering roofing material as claimed in claim 8, where prior to applying the polyurethane adhesive composition to the roof deck, the roof deck is misted with an acidic, aqueous solution.

11. The method of adhering roofing material as claimed in claim 8, where the organic polyisocyanate is diphenylmethane diisocyanate.

12. The method of adhering roofing material as claimed in claim 8, where the composition containing at least two isocyanate reactive moieties is a polyether polyol free of nitrogen.

13. The method of adhering roofing material as claimed in claim 8, where the reversibly blocked catalyst is the reaction product of a sulfonyl isocyanate, a tertiary amine, and a tin(II) or tin(IV) carboxylate composition.